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A Systemic Analysis of Military Equipment Acquisition Among NATO Suppliers: A Proof of Concept Based on a Multi-Layered DSS Approach

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Monterey, California. Naval Postgraduate School

A Systemic Analysis of Military Equipment Acquisition among NATO Suppliers:
A Proof of Concept Based on a Multi-Layered DSS Approach

Martin Zsifkovits*, Gonzalo Barbeito*, Dieter Budde**, Max Krüger***, Stefan Pickl*

* University of the Federal Armed Forces Munich, Germany
** Major General (ret), German Armed Forces
*** University of Applied Sciences Furtwangen, Germany

Agenda

- Introduction
- Multi-Layered Systemic Acquisition Approach
- Qualitative Analysis
- Quantitative Analysis
- Simulation Execution and Results
- Conclusion and Future Work

Introduction

- Underlying network of complex networks.
- Foreign politics and home affairs.

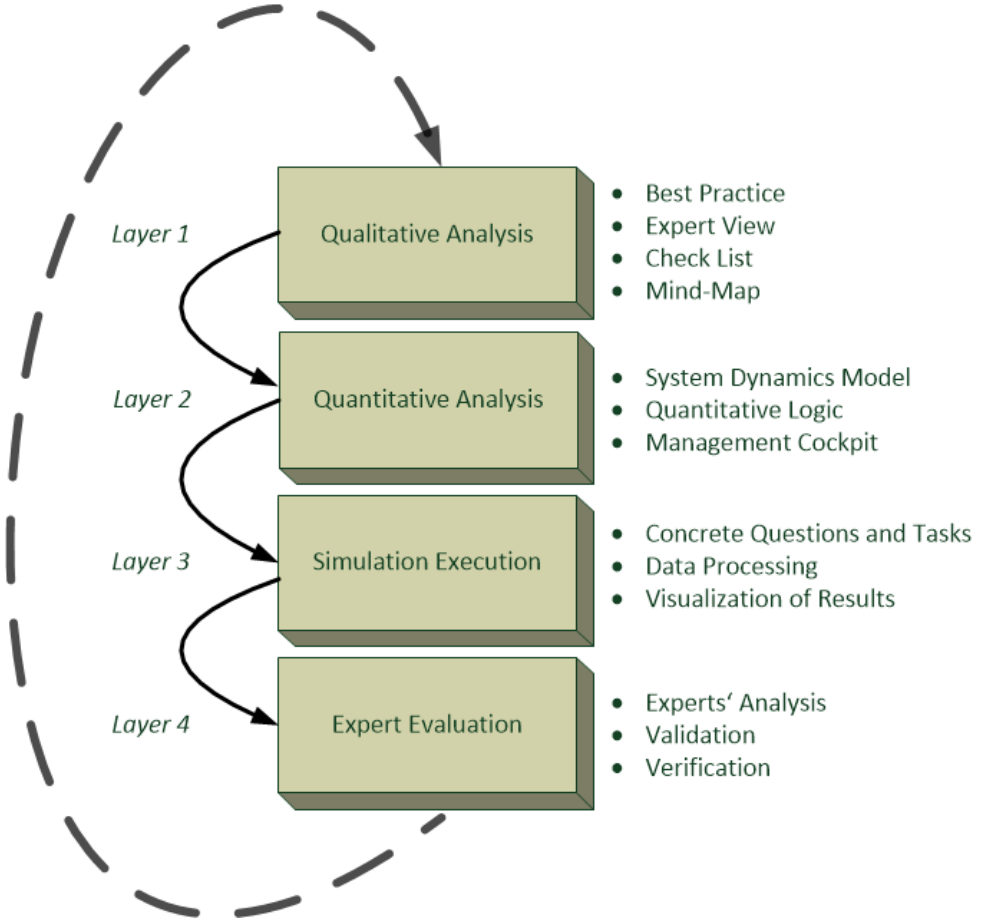
- Multilayered: different sectors being involved.
- Multistage: dynamic behavior of the time-dependent process.

Introduction

"Big Five of an Advanced Acquisition Architecture":

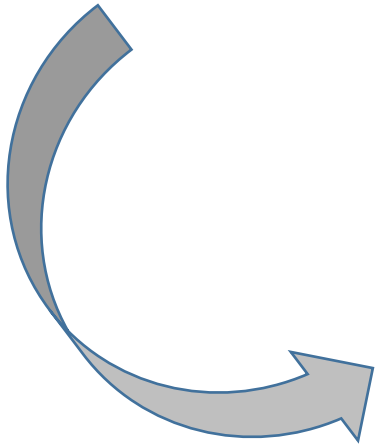
- Better coordination,
- Better monitoring,
- Better interpretation,
- Better services,
- Better process-stability.

Multi-Layered Systemic Acquisition Approach



Qualitative Analysis

SUPPLIER	TECHNICAL ATTRIBUTES				MAINTENANCE ATTRIBUTES			SUPPLY SIDE ATTRIBUTES			Cost Upgrade	Price/U
	Equip	Range	Versatility	Load	length	cost/rev	r	n lines	time/unit	stock T(0)		
1	3	6	8	3	20	€ 50.000	2	2	5	10	€ 150.000	€ 1.000.000
2	6	3	7	7	25	€ 70.000	3	4	6	5	€ 50.000	€ 1.200.000
3	8	7	8	5	30	€ 100.000	2	2	4	8	€ 200.000	€ 1.300.000
4	4	4	5	7	10	€ 50.000	2	5	7	5	€ 150.000	€ 800.000
5	4	6	8	7	20	€ 150.000	1	10	12	10	€ 60.000	€ 1.100.000
6	5	5	10	1	30	€ 220.000	1	8	3	0	€ 130.000	€ 900.000
7	4	4	3	6	20	€ 75.000	2	6	5	2	€ 200.000	€ 700.000
8	2	7	4	4	15	€ 75.000	3	7	4	15	€ 80.000	€ 800.000
9	8	8	6	8	10	€ 100.000	3	3	7	4	€ 320.000	€ 2.200.000
10	5	4	6	4	20	€ 80.000	2	3	6	7	€ 120.000	€ 1.100.000



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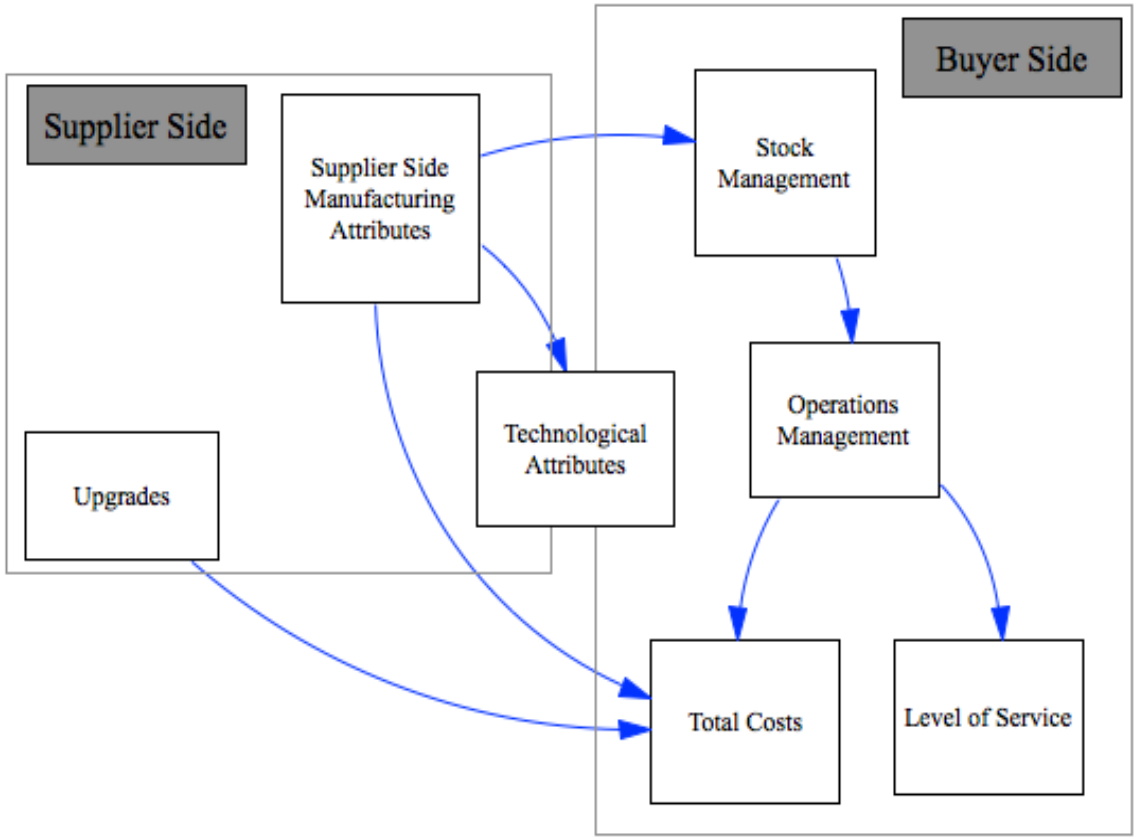
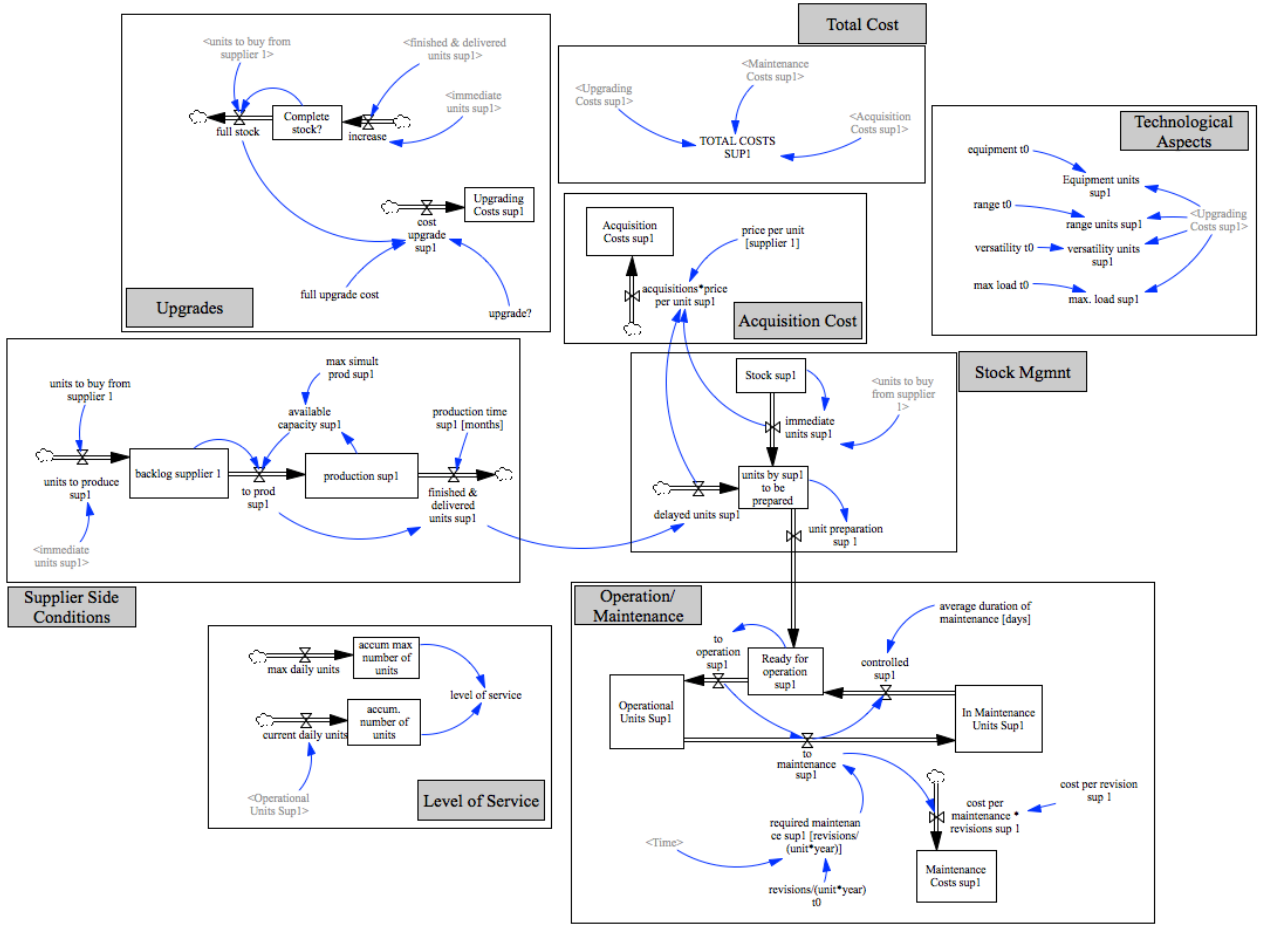
Qualitative Analysis

Mind Map



Quantitative Analysis

- System Dynamics Modeling
- Including Various Sub Models.
- Considering Interactions.
- Quantifying Influences.



Simulation Executions and Results

Key Questions:

- What is the technological status and potential of each product?
- What is the overall cost of acquisition over 20 years, including all relevant factors?
- What is the service level of each supplier over the planning time horizon?

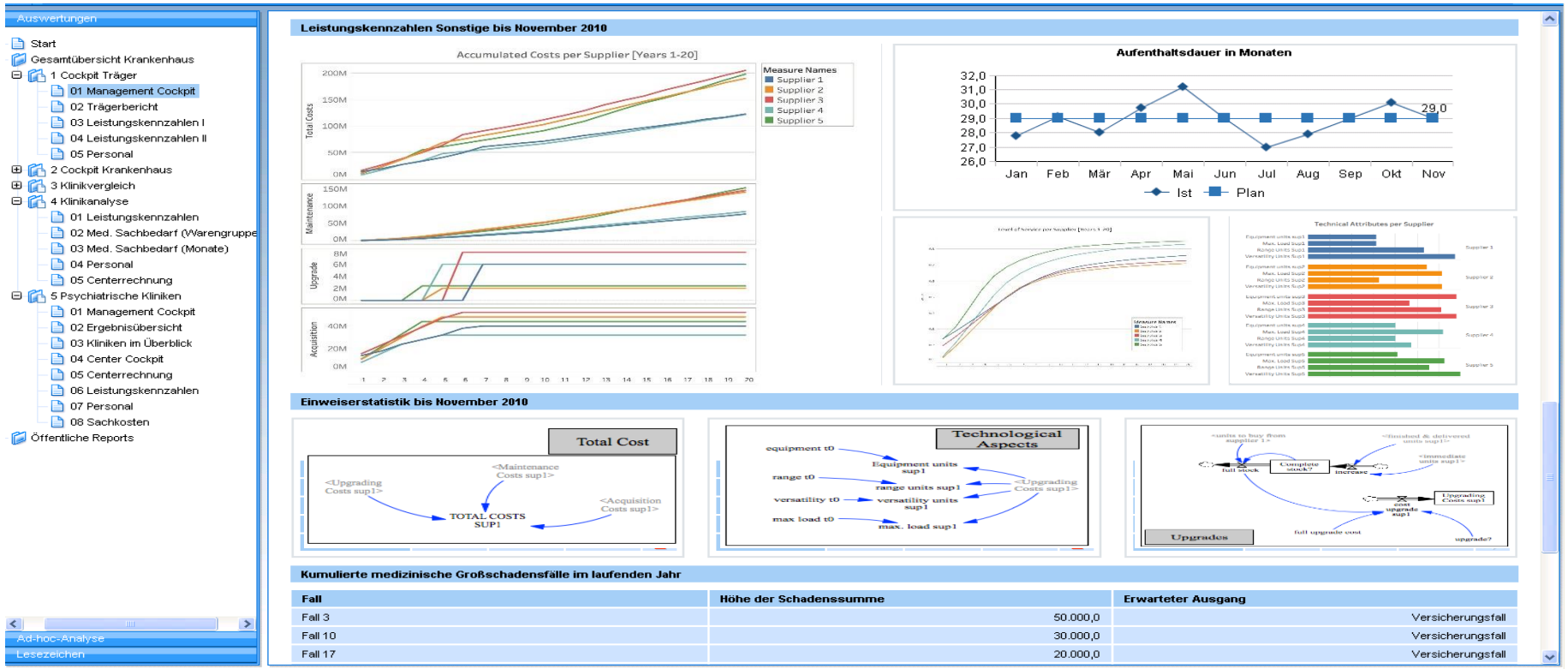
Simulation Executions and Results

Conclusion and Future Work

- Presented an approach for a transparent acquisition process.
- Qualitative and quantitative measures combined over several layers for a holistic view.
- Model is used to assess the entire life-cycle of ordnance.
- Further Research is needed, especially for more complex (real) scenarios.

Conclusion and Future Work

- An IT based management cockpit might lead to higher acceptance by practitioners.



Thank you very much for your attention!

Questions?